

REMARKS/ARGUMENTS

This is a reply to the Non-Final Office Action dated August 23, 2007.

Status of Claims

Claims 1-3, 6-12, and 14-17 are currently pending this application. Claims 4, 5 and 13 have been canceled. Claims 1 and 7 are presently amended. New claims 14-17 are presently added.

Claim Amendments

Claim 1, as amended, clarifies the formation of a hydroentangled nonwoven fabric by the step of applying hydraulic energy (page 2, line 20; page 3, line 2; page 5, lines 5-8), and also clarifies the succession of method steps of acid washing the nonwoven fabric, rinsing the acid-washed nonwoven fabric, and drying the rinsed nonwoven fabric is performed sequentially without intervening steps (e.g., page 5, lines 16-20; Fig. 1). For example, Fig. 1 of the present application illustrates and teaches acid wash station 23, rinsing station 24, and drying station 26 performed in succession without intervening different process steps. In this regard, dewatering 25 serves as a preliminary part of the drying operation (page 5, lines 16-20), and therefore, is not a different intervening process step.

Claim 6, as amended, clarifies that the product is a nonwoven fabric wipe (page 2, lines 19-21; page 5, lines 28-29; page 6, line 4), and also the process route used in making the product.

Claim 7, as amended, also has been amended to clarify the formation of a hydroentangled nonwoven fabric by the step of applying hydraulic energy (page 2, line 20; page 3, line 2; page 5, lines 5-8), and further recites pulling said acid wash through said nonwoven fabric by vacuum (page 3, lines 8-11), and, similar to claim 1, clarifies the succession of method steps of acid washing the nonwoven fabric, rinsing the acid-washed nonwoven fabric, and drying the rinsed nonwoven fabric is performed sequentially without intervening steps (e.g., page 5, 16-24; Fig. 1).

Claim 11, as amended, clarifies that the product is a nonwoven fabric wipe (page 2, lines 19-21; page 5, lines 28-29; page 6, line 4), and also the process route used in making the product.

New claims 14 and 16 are supported by the disclosure of Fig. 1 and the corresponding descriptions of the specification at page 4, line 26 to page 5, line 24.

New claims 15 and 17 are supported by the disclosure of Fig. 1 and the corresponding descriptions of the specification at page 5, lines 18-20.

No new matter has been introduced.

Substance of Interview

Applicant's undersigned representative thanks the Examiner of record for the courtesy of the personal interview conducted with said representative and the applicant's in-house patent counsel, Valerie Calloway, on this application on October 17, 2007. This Substance of the Interview by the applicant is responsive to the Office Communication dated October 19, 2007 including the Examiner's Interview Summary. At the interview, the applicant's representatives submitted proposed amendments to the claims for discussion. They discussed that the primary reference to Oathout combines synthetic fiber and cellulosic pulp fiber layers in a spunlaced fabric, but does not teach acid washing the fabric or appreciate the problem of high sodium ion content in clean room wipes. It also was discussed that Bahten's wipe 105 is a foam material wipe and not a nonwoven fibrous wipe material. It was further discussed that Bahten teaches the need to include caustic wash and chelating steps in addition to acid wash, rinse and dry steps in order to achieve low ion content in the treated materials. As indicated in the Interview Summary, the Examiner indicated that there is nothing in the record to support removing steps from the process of Bahten. To better emphasize this difference with Bahten, the Examiner was understood to suggest that applicants consider amending the present claims to incorporate language that would clarify that acid washing, rinsing and drying are performed sequentially without intervening steps. As to the Palm et al. reference, the applicant's representatives discussed that this reference concerns a rigid static composite structure and not a fabric material, and the ability to acid wash such a structure would not predict usefulness in the other environment. There also was some discussion of the Wallis et al. reference mentioned in the most recent Office Action. The applicant's representatives discussed that Wallis et al. teaches acid-impregnated clean room wipes used to neutralize caustic chemical spills, and such a wipe would be expected to store sodium ion content in the wipe until use. No specific agreement on allowable subject matter of any particular claim of record was reached at the time of the interview. The applicant's representatives indicated they would prepare additional amendments to the claims, consistent with the above-indicated suggestions made by the Examiner at the interview, for submission as part of a written response to the Office Action for further consideration by the Examiner.

Response to 35 U.S.C. § 103(a) Rejection of Claims 1-3 and 6-12 Based on Oathout, Bahten and Palm et al.

Claims 1-3 and 6-12 have been rejected under 35 U.S.C. § 103(a) as obvious over Oathout (USP 5,459,912) in view of Bahten (USP 6,182,323), and further in view of Palm et al. (U.S. Pat. No. 5,459,912).

The Patent Office's Position

The Patent Office is understood to take the position that Oathout disclose a clean room wipe having hydroentangled natural and polymeric staple fiber layers, but differs from the claimed invention by not teaching a sodium ion content less than 25 ppm or that it should be rinsed with acetic acid/water solution. The Patent Office urges that Bahten makes up for this difference of Oathout by teaching materials intended for use in clean room wipes or brushes that can be subjected to acid washing, rinsing, and drying, and that Bahten indicates that the treated materials can have a sodium ion content less than 10 ppm. The Examiner acknowledges that neither Bahten nor Oathout teaches employing acetic acid to reduce sodium ion content in the treated materials. However, the Patent Office urges that Palm et al. makes up for this difference by teaching acetic acid is an art recognized equivalent to citric acid, which is taught by Bahten. The Patent Office states that Applicants have argued that Bahten is drawn to foams and sponges rather than clean room wipes. In response, the Patent Office argues that Bahten teaches that the materials can be in the form of “wipes, rather than foams, brushes or sponges” (citing col. 3, lines 24-25 of Bahten). The Patent Office also states that Applicants have argued that Oathout is drawn to cellulosic fibers rather than the synthetic materials of Bahten. In response, the Patent Office argues that Oathout comprises both cellulosic and synthetic polymeric fibers, and both the Oathout and Bahten references deal with methods of forming clean room materials. The Patent Office also states that Applicant has argued that Bahten teaches away from the claimed invention because citric acids would be expected to harm cellulosic fibers. In response, the Patent Office argues that the references cited by the Applicant in support of this argument do not deal with clean room applications. Further, the Patent Office urges that “considerations such as odor and/or yellowing may or may not be a concern in a clean room wipe, since aesthetic considerations may not be as important as functionality of the acid wash.” The Patent Office then makes further reference to Wallis et al. (U.S. Pat. No. 6,645,930), and urges that Wallis et al. notes that “both

citric acid and acetic acid were known to be useful treatments for clean room wipes, including wipes which comprised cellulosic fibers” (citing col. 3, lines 28-57; col. 5, lines 1-55).

According to the Patent Office, in view of the evidence of Wallis that acetic and citric acid were known to be useful as treatments for cellulosic clean room wipes, the argument that Bahten teaches away from the claimed invention is not persuasive. The Patent Office also states that Applicant has argued that Bahten teaches away from the claimed process because it uses multiple washing steps in the washing process, to which the Patent Office responds that the instant claims use open language and thus do not preclude additional steps. The Patent Office also states that Applicant has argued that Palm et al. is unrelated to the claimed invention because Palm et al. does not disclose materials which are in fiber form. In response, the Patent Office acknowledges that Palm et al. does not teach fibrous materials but clearly sets forth at col. 13 that acetic acid was recognized in the art as equivalent to citric acid (which is taught by Bahten) for the purpose of washing materials in order to remove impurities. The Patent Office also is understood to urge that Palm et al is analogous art as it is concerned with performing acid washes to remove residual impurities from materials and therefore is reasonably pertinent to the problem with which applicant was concerned.

The Applicant's Response

The present invention concerns manufacture of nonwoven wipe constructs suitable for use in clean room applications, such as are employed in the manufacture of microelectronic components and devices. In such an environment, the provision of wipes exhibiting very low sodium content *and* low linting is extremely important. Acetic acid washing, rinsing, and drying steps are performed sequentially without intervening steps as part of other processing, to provide a non-woven wipe having these combined very low sodium content (<45 ppm Na) and low linting features without adversely impacting or altering the nonwoven fabric.

Oathout does not teach or suggest any problem with his nonwoven fabric wipes in regard to sodium ion content. No prior art of record *in the textile wipe arts* suggests such a problem was recognized. It is respectfully submitted that the secondary references do not compensate for the differences between the Oathout reference and the present claims.

Bahten discloses ultraclean surface treatment using foam products, and not textile products or their manufacture. The foam products of Bahten have been treated with process steps

of solvent-washing, acid-washing, caustic-washing, chelation, and so forth, which is indicated to lower impurity levels in the foam products. Referring to Fig. 3A of Bahten, caustic wash 341 and chelating step 342 are used between acid wash 339/rinse 340 steps and later rinse 343/dry 344 steps. According to Bahten, the caustic wash 341 is needed to remove negative ions and chelating step 342 is needed to remove additional trace metals from the products (col. 11, lines 29-67). Bahten nowhere teaches, suggests or supports a prediction that these treatments, or a lesser included combination of these process steps, also can be successfully applied to textile products for providing very low impurity levels.

Independent claims 1 and 7 have been amended to clarify that the acid washing, rinsing, and drying steps are performed sequentially without intervening steps. As noted above, Bahten requires additional caustic wash and chelating steps in his process. The independent claims 1 and 7 thus have been amended to close off the claims to possible coverage of additional steps required by Bahten's process. No prior art of record suggests eliminating the caustic wash and chelating steps of Bahten, nor that the Bahten process would be effective without them, particularly if applied to nonwoven fabric treatments. New claims 14-17 are believed to further clarify this difference from Bahten.

As also discussed at the most recent interview, although Bahten teaches materials can be in the form of "wipes," the wipe 105 shown in Fig. 1 of Bahten (see col. 3, lines 20-24; col. 4, lines 10-12) is understood to be an alternative *shape* of the *foam product*, and *not* a different material such as a fibrous cloth material. Wipe 105 has a shape indicated in Fig. 1 of Bahten that appears to be consistent with a standard household type sponge wipe. Therefore, present independent nonwoven fabric wipe claims 6 and 11 reciting a hydroentangled synthetic fiber and wood pulp subsequently exposed to acetic acid wash, de-ionized water rinse, and drying to yield a fabric product having a sodium ion particle count less than 45 ppm (or 25 ppm) are not predicted to be attainable by modifying fabric products of Oathout by Bahten's process used for treating foam materials.

As to the reference to Wallis et al., this reference does not teach washing wipes with either acetic acid or citric acid as apart of a process to reduce sodium ion content in the wipe. Instead, Wallis et al. is impregnating a wipe with an organic acid so that the resulting wet wipe can be used to neutralize caustic in spilled chemicals (col. 3, lines 26-50). The reason for impregnating the wipe with acid in Wallis et al. is to keep and store the acid in the wipe until

wipe is used for caustic chemical cleanup and neutralization. Thus, by design, the acid is left in the Wallis wipe and is never rinsed out before use. As can be appreciated, any sodium ions would still be retained within the acid-impregnated Wallis wipe.

Palm et al. relates to resin-inorganic particle composite-based filtration media that understood to be rigid static structures. The composite media may be washed to lower soluble contaminant content such as iron or aluminum. Textile fabrics have different structural and physical properties than rigid composite materials such as used in Palm et al. Palm et al. does not teach, suggest or support a prediction that the acid wash treatments described therein for resin-inorganic particle composite-based media also can be successfully applied to textile fabric products for lowering impurity levels therein.

The present claims recite the use of acetic acid washes. The most recent Office Action indicates that the references cited with applicant's most recent response showing that citric acid, the only organic acid taught by Bahten for acid-washing, can be harmful to cellulosic fibers, can be disregarded because they do not deal with clean room applications. The applicant kindly disagrees. One of ordinary skill would be dissuaded from using materials expected to induce undesirable odor development or discoloring of the product material.

Applicant also points out that claim 7, as amended, also clarifies that the application of the acetic acid wash to the hydroentangled nonwoven fabric *includes pulling said acid wash through said nonwoven fabric by vacuum to providing an acid-washed nonwoven fabric*. It is respectfully submitted that this feature further separates claim 7 from the relied upon references of Oathout, Bahten and Palm et al., which do not teach this feature.

In view of at least the above reasons, the applicant respectfully submits that the proposed combination of Oathout, Bahten and Palm et al. does not render the present claims prima facie obvious.

In view of at least the above, reconsideration and withdrawal of the rejection is respectfully requested.

It is believed that this application is in condition for allowance, and notice of such is respectfully requested.

U.S. Patent Application No. 10/650,584
Amendment After Non-Final Rejection
Reply to Office Action dated August 23, 2007

If the Examiner believes that a teleconference would be useful in expediting the prosecution of this application, the official is kindly invited to contact Applicant's undersigned representative of record.

Respectfully submitted,

/Ramon R. Hoch/

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